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What is the Role of a

Universal Data Element Framework

in the Envisioned

Integrated Data Environment?

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Enterprise Data Task Group

Industry

- Ron Schuldt (Chair& Author) - Lockheed Martin
- Barbara Barman (Vice Chair& Co-Author) - Raytheon
- Rob Bryant - DynCorp
- Ruey Chen - David Taylor Research Center
- Bob Hodges - Texas Instruments
- Neal McNamara - Analysis & Technology Inc.
- Bud Orlando - TRW
- Madelyn van der Bokke - ASEC
- George Walther - Lockheed Martin

Government

- Norma Kornwebel - PM JCALS
- Dinah Beres - NAWC
- Steve Waterbury - NASA

The CALS Vision

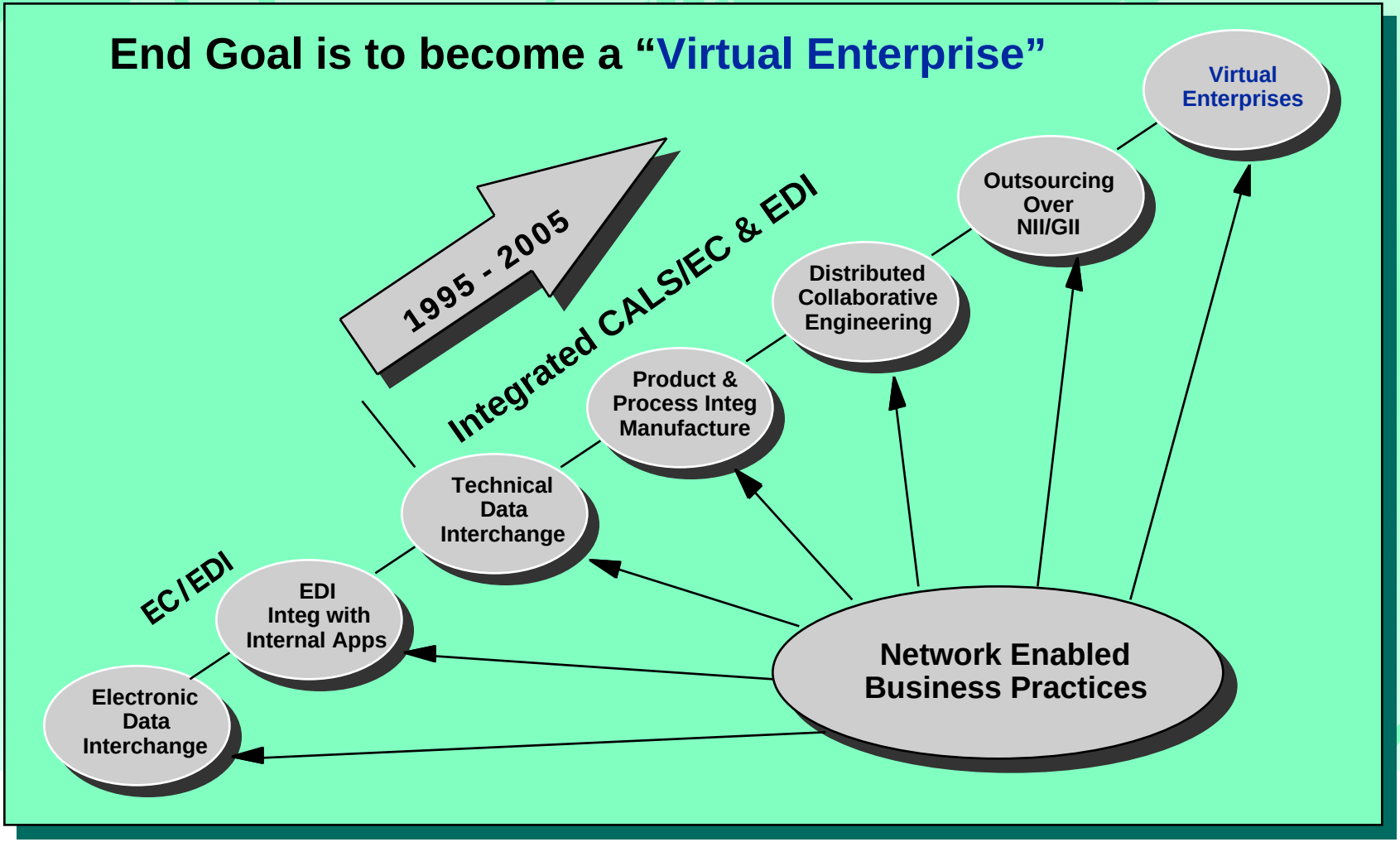
Quote from CALS Home Page -> http://www.acq.osd.mil/cals/

The DoD is committed to incorporating CALS into functional process improvements. As DoD applies the best technologies, processes, and standards for the development, management, exchange, and use of business and technical information among and within governmental and industrial enterprises, an Integrated Data Environment (IDE) will be generated. The IDE is defined as *the business environment created by the application of existing national and international standards, practices, and technologies to automate the management and exchange of information*. The IDE directly enables Integrated Product and Process Development while increasing the agility and decreasing cycle times of the Defense Enterprise. CALS is founded on the recognition that affordable, readily accessible, and timely technical and business information is a critical element of the acquisition process.

What is Integrated Data Environment? CALS

- **According to Draft White Paper by OUSD (A&T)**
  - **–"...represents the end state of a vision in which technical and business data is highly visible to all participants..."**
  - **–"...deployment will be guided by a Shared Information Framework which defines the implementing processes ..."**
  - **–"...framework sets performance requirements, ...and other "rules of engagement" for an ...enterprise to participate in the IDE."**
  - **–"...rules will include data standards, data packaging and structuring schemata..."**
  - **–"...will be implemented as part of the Defense and National Information Infrastructures (DII/NII)."**

CALS EC/EDI Continuum



The Challenge

A Real Example

Engineering	Manufacturing	Logistics	Acquisition
Component Part (M)	Comp Part Nbr (T/M)	Part Number (M)	Part Number (T)
Assembly Number (M)	Parent Part (T/M)	NHA (M)	Next High Assem (T)
Part Nomenclature (M)	Item (T/M)	Nomen (M)	Item Description (T)
		Item (M)	Spare Item No. (T)
FSCM (M)	FSCM (T/M)	CAGE (M)	Suggested Supplier (T)
	Due Date (T/M)	NEEDDT (M)	Need Date (T)
Effectivity (M)	Model (S/M)	Effectivity (M)	Effectivity (M)

M = Manual Entry; T = Data Translation; T/M = Translation and Manual; S/M = Host and Manual

The Challenge is Legacy Data

Related Issues

- "Virtual Enterprises" imply seamless tools
  - How will legacy systems be integrated?
  - How will legacy data be reused?
  - Who pays for the conversion costs?
  - How will industry systems interface at data element level with JCALS/JEDMICS/CMIS?
  - Who has the authority to decide the answers and the funding to drive them?
  - Who will provide the data administration tools?

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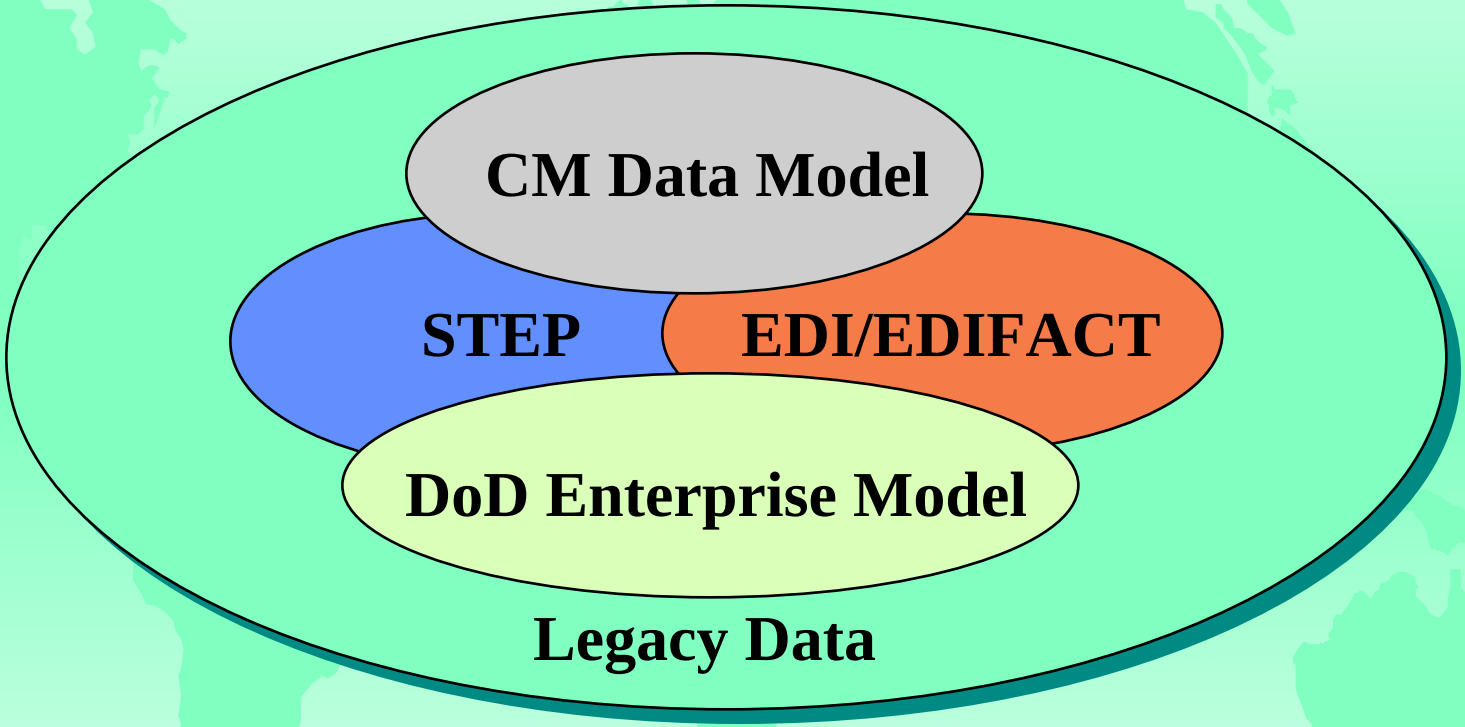
Data Standards Issues

- How will overlapping data standards (STEP, EDI, CM model, DoD model, etc) be reconciled?
- Will voluntary organizations “harmonize” the overlapping standards themselves?
- How will a globally unique identifier be established per ISO/IEC 11179-3?
- Who will perform the registration authority function per ISO/IEC 11179-6?

Big Picture of Problem



What tool will help identify collisions?
Who has authority to resolve collisions?

Require Master Data Dictionary

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- Use Universal Data Element Framework developed by CALS ISG
  - Object oriented
  - Satisfies ISO/IEC 11179 requirements
  - Satisfies DoD 8320.1-M-1 naming requirements
  - EIA G-33 mapping all CM data model data elements to Framework
  - Needs to become part of DoD's IDE Framework

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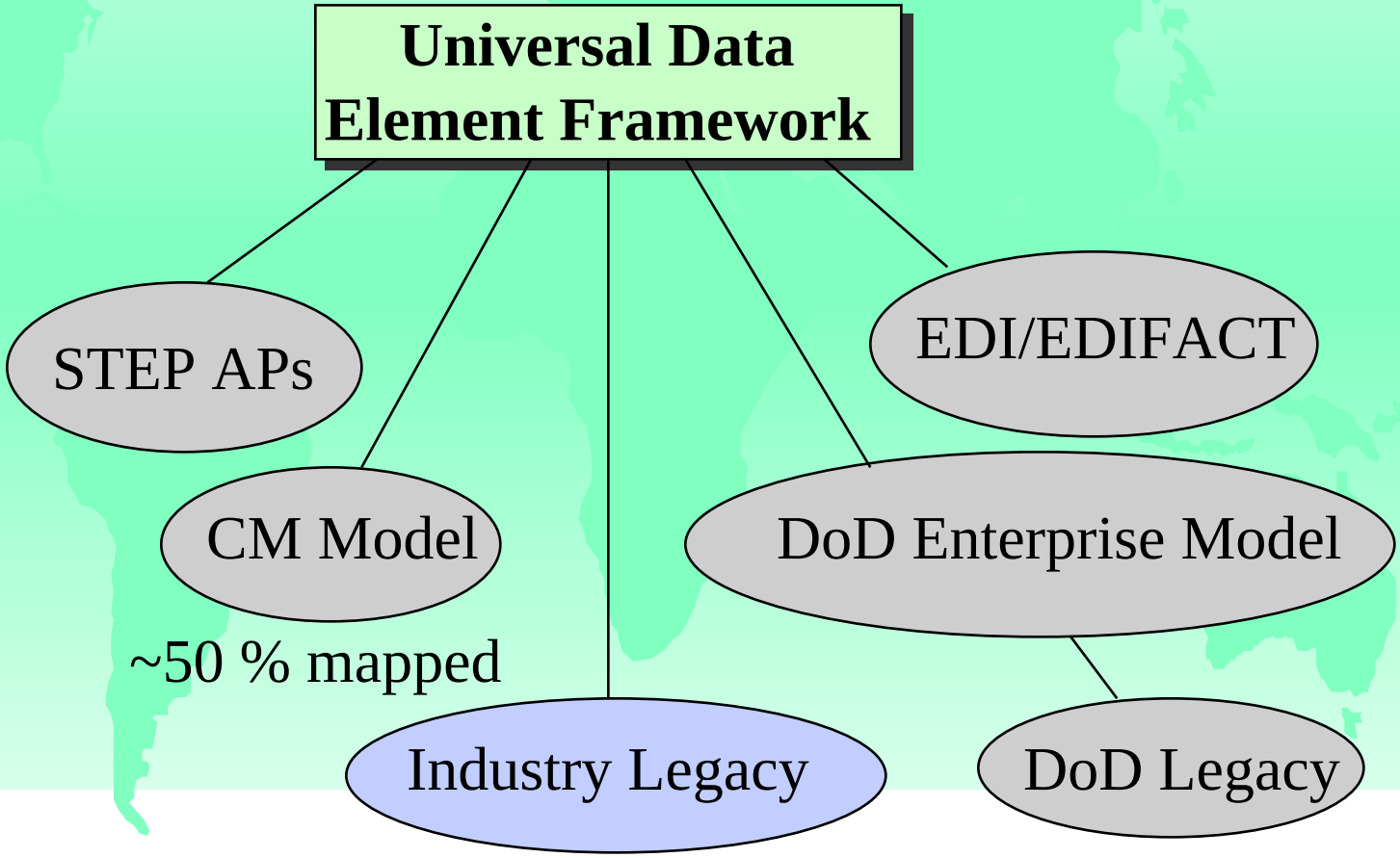
Approach

Map Existing Data Standards to Same Universal Framework



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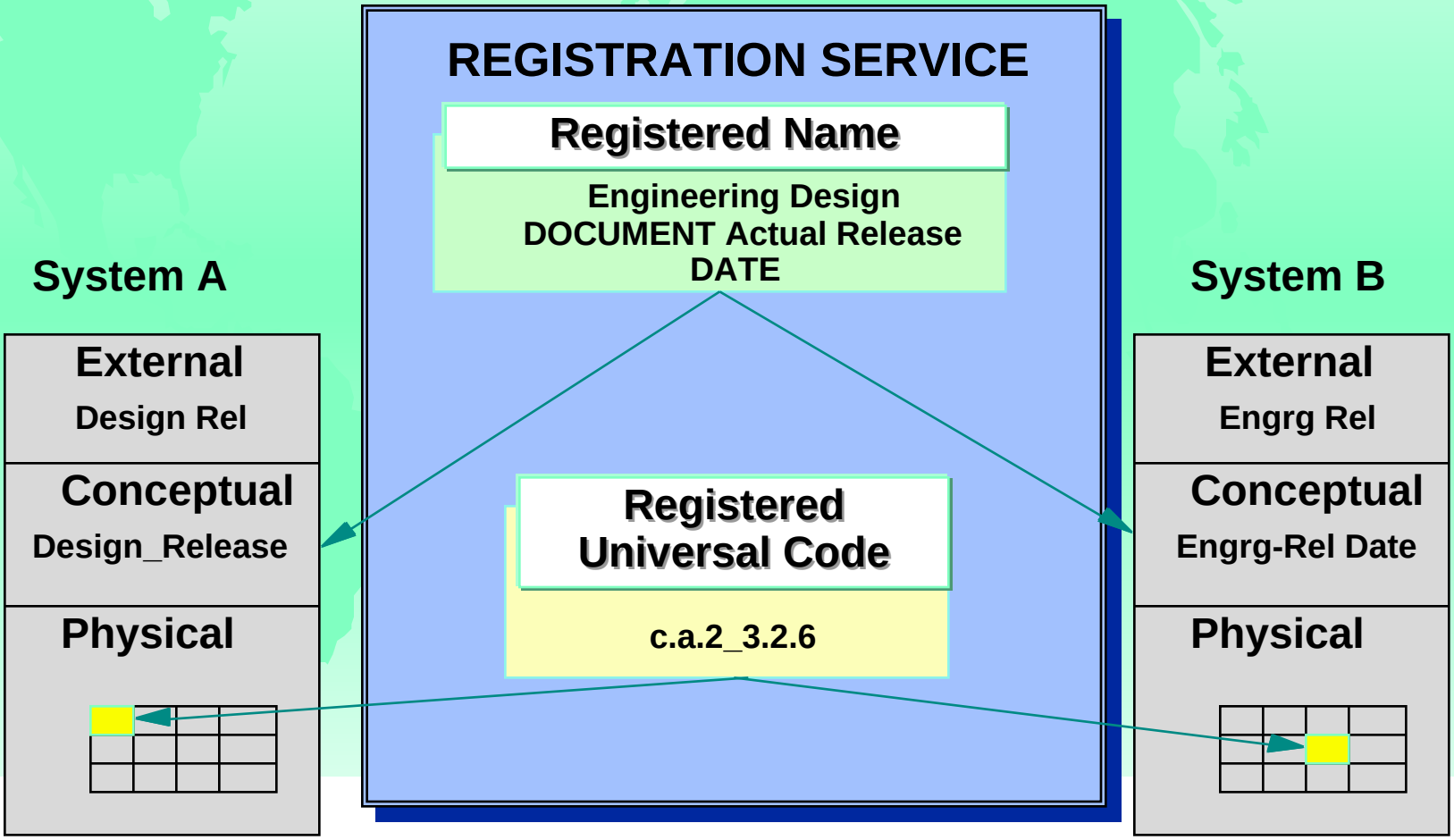
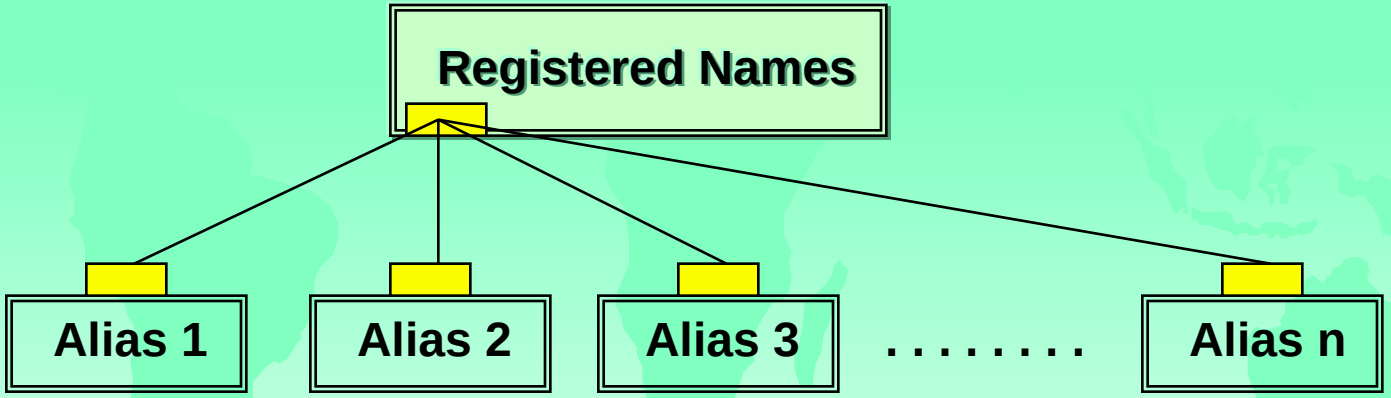
Need Registration Authority



Integration Key

Universal Code is the "key" to legacy integration



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Prime and Class Words

Asset = 1	Amount = 1
Document = 2	Angle = 2
Enterprise = 3	Area = 3
Environment = 4	Code = 4
Human = 5	Coordinate = 5
Law/Rule = 6	Date = 6
Place = 7	Dimension = 7
Process = 8	Identifier = 8
Product = 9	Mass = 9
Program = 10	Name = 10
	Quantity = 11
	Rate = 12
	Temperature = 13
	Text = 14
	Time = 15
	Volume = 16
	Weight = 17

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Master Dictionary Built on Hierarchical Object Trees

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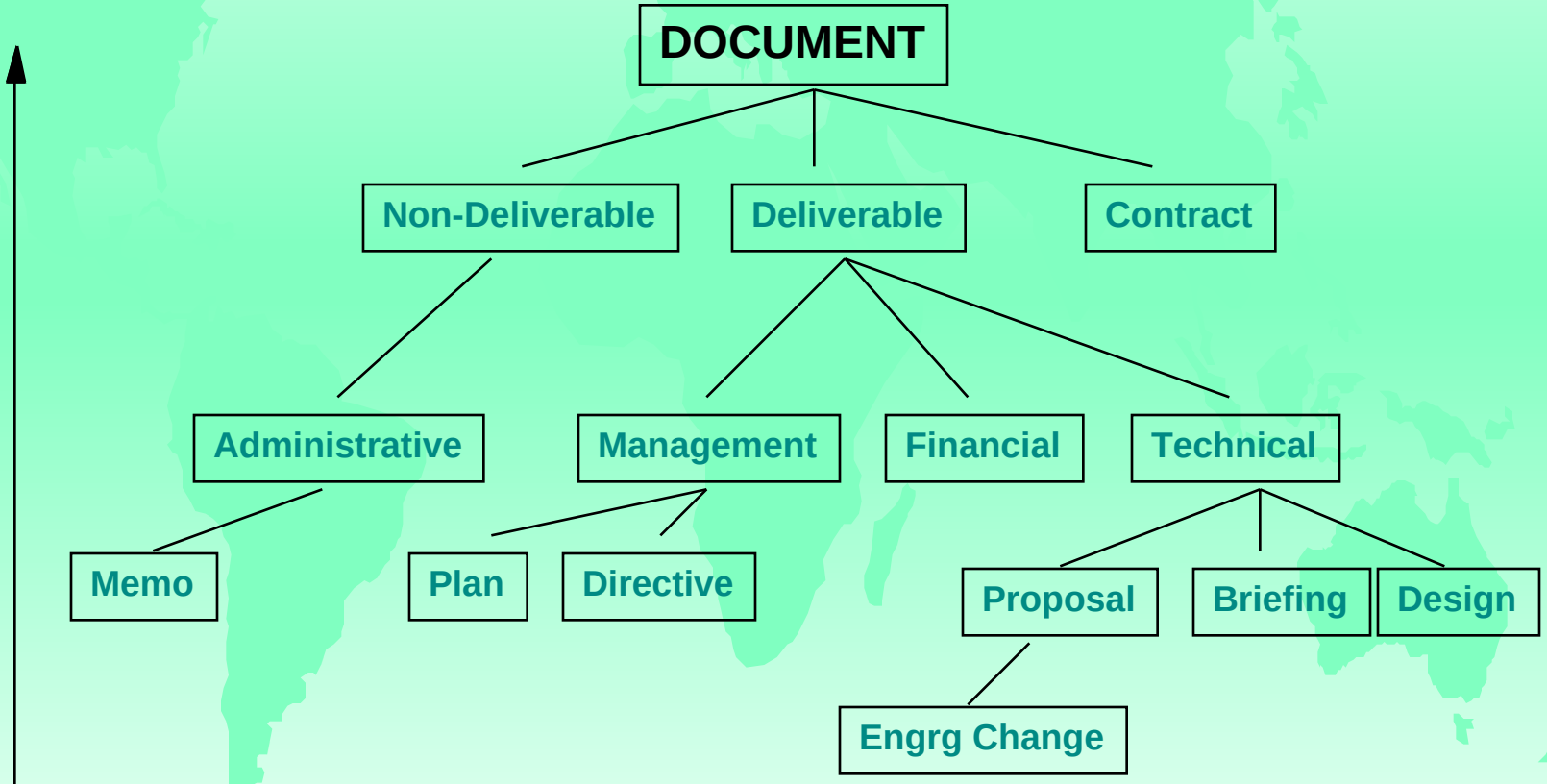
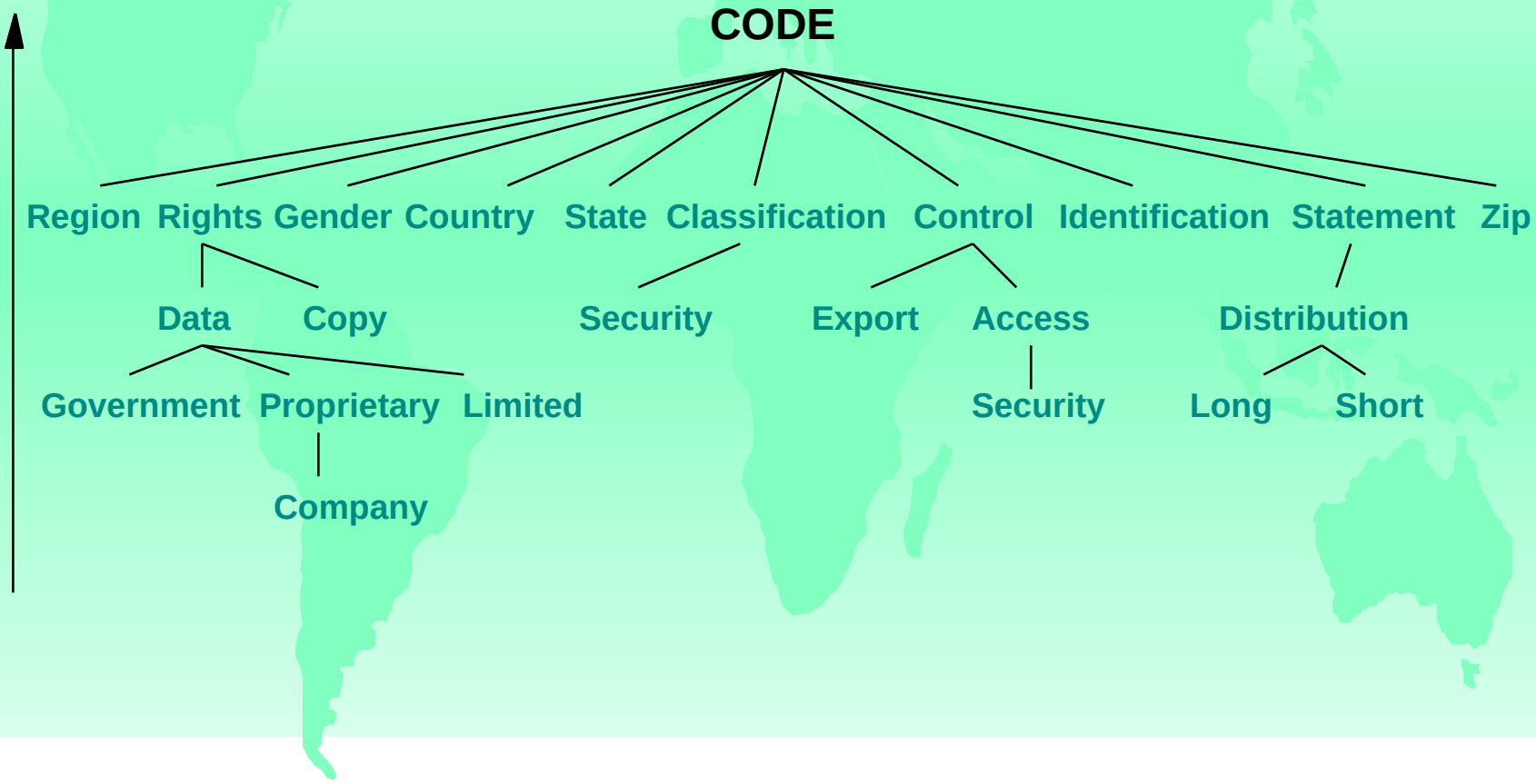


Example “Code” Tree



Example CM Data Model Mappings and Code

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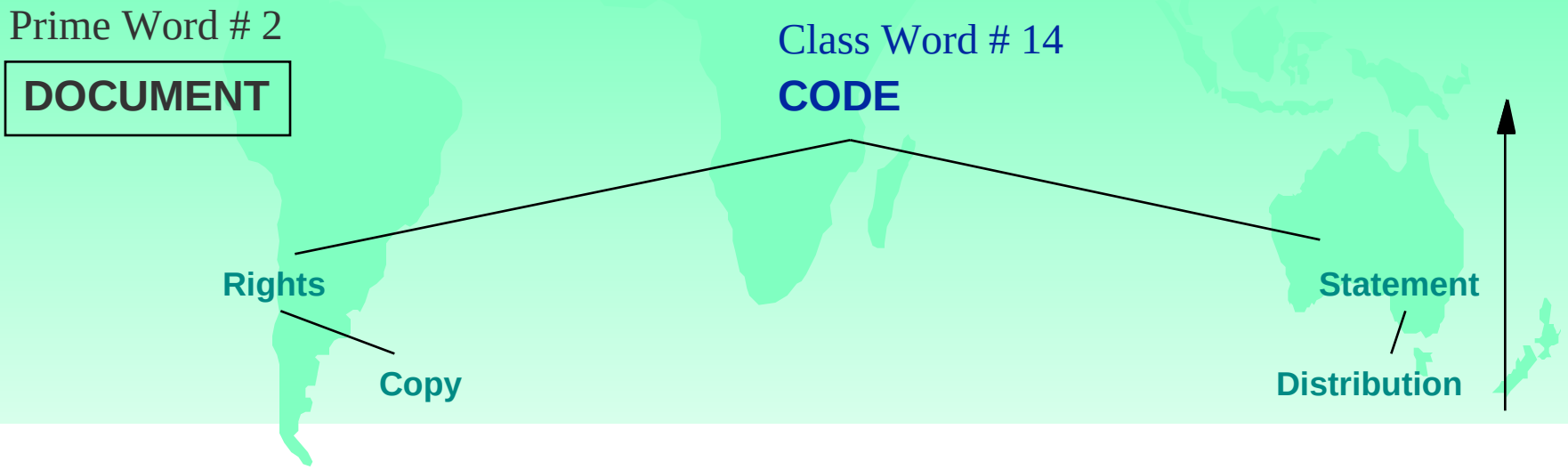
CM Data Model Data Elements	Universal Code
document-copyright-**code**	2_2.2.14
document-distribution-statement-**code**	2_1.9.14



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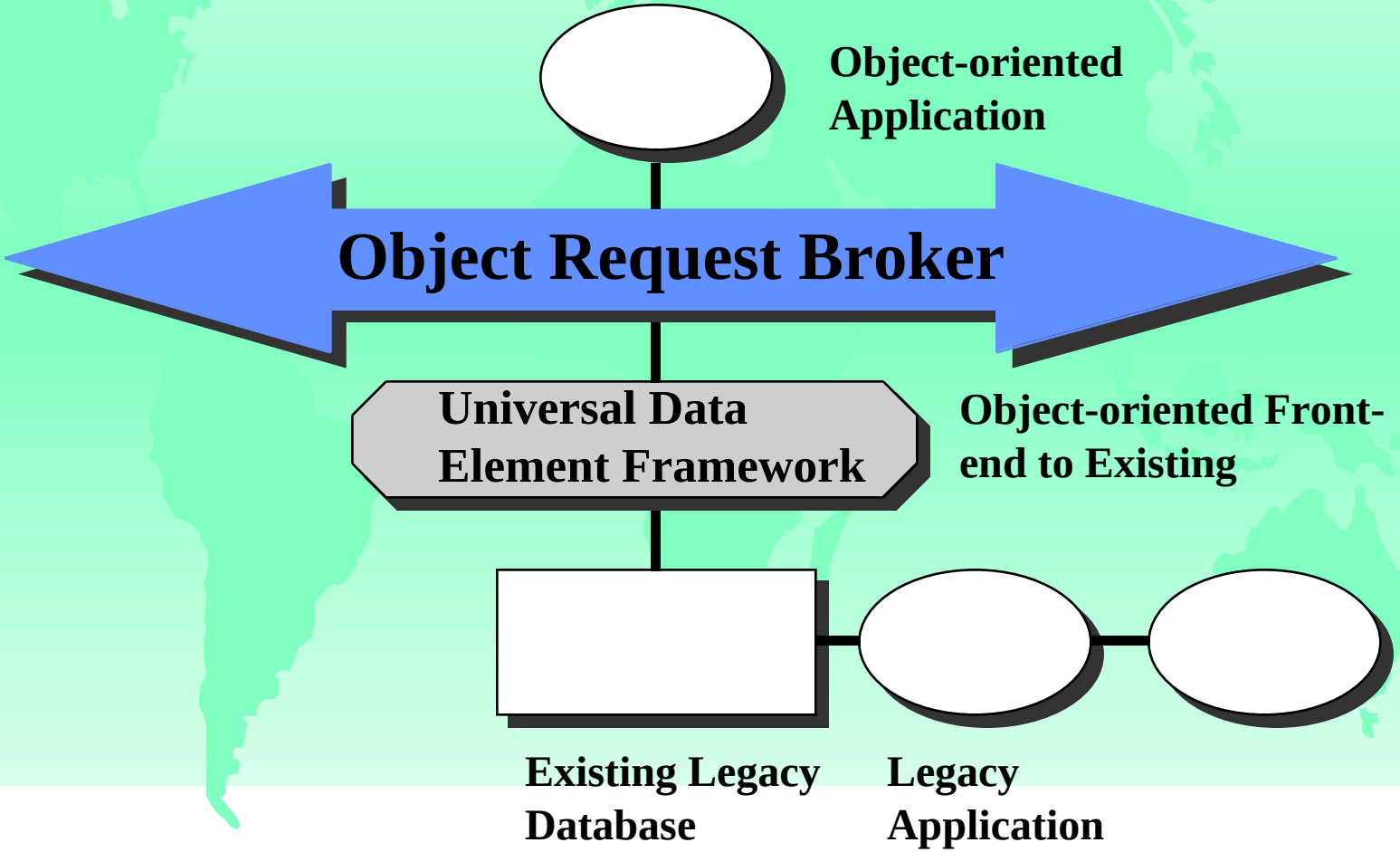
Interface to Legacy



Role of Universal Data Element Framework

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- A part of the overall IDE integration framework
  - A data level interface standard (Master Data Dictionary & Derived Universal Codes)
- Primary tool for integrating legacy data
  - When implemented as an object-oriented front-end to existing systems
  - Interfacing CITIS to JCALS GDMS (IWSDB)
- Help harmonize overlapping standards

Helpful WWW Pages

- **ANSI X3L8 and ISO/IEC JTC1 data standardization activities**
  http://www.lbl.gov/~olken/x3l8.html
- **United Nations Basic Semantic Repository (BSR) activities**
  http://www.premenos.com/klaus/bsr/bsr.html
- **National Industrial Information Infrastructure Protocol (NIIIP)**
  http://www.niiip.org/